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### ABSTRACT OF THE INVENTION

A method of making interferometric measurements of an object, the method including: generating an input beam that includes a plurality of component beams, each of which is at a different frequency and all of which are spatially coextensive  
5 with each other, some of the components beams having a first polarization and the rest having a second polarization that is orthogonal to the first polarization; deriving a plurality of measurement beams from the plurality of component beams, each of the plurality of measurement beams being at the frequency of the component beam from which it is derived; focusing the plurality of measurement beams onto a  
10 selected spot to produce a plurality of return measurement beams; combining each of the return measurement beams of the plurality of return measurement beams with a different corresponding reference beam of a plurality of reference beams to produce a plurality of interference beams; and acquiring a plurality of electrical interference signal values for the selected spot from the plurality of interference  
15 beams.